What is claimed is:

1. (once amended) A process for the preparation of an MR contrast agent comprising:

i) obtaining a solution in a solvent of a hydrogenatable, unsaturated substrate compound and a catalyst for the hydrogenation of said substrate compound; and

ii) introducing said solution in droplet form into a chamber containing hydrogen gas (H_2) enriched in para-hydrogen ($p\text{-}^1H_2$) and/or ortho-deuterium ($o\text{-}^2H_2$) to hydrogenate said substrate to form a hydrogenated imaging agent.

2. (once amended) The process of claim 14 wherein said field strength in step (iii) is less than 50 μT.

3. (once amended) The process of claim 14 wherein said field strength in step (iii) is less than 1 μT.

4. (once amended) The process of claim14 wherein said field strength in step (iii) is less than or equal to 0.1 μT.

5. (once amended) The process of claim 14 wherein said field strength in step (iii) is cycled in a first part from earth's ambient field strength to a field strength less than 0.1 μT, and in a second part back to ambient field strength again.

6. (once amended) The process of claim 5 wherein the first part of the cycle is approximately ≤ 1 ms and the second part is approximately 10-10000 ms.

7. (once amended) The process of claim 1 wherein said process is carried out directly in water and wherein both said substrate and said catalyst are water-soluble.

8. A hydrogenation apparatus comprising a hydrogenation chamber having a liquid outlet into a conduit leading to a liquid droplet generator inlet to a solvent removal chamber,
said hydrogenation chamber having a hydrogen inlet and a solution inlet provided with a further liquid droplet generator,
said conduit including a catalyst removal chamber between said hydrogenation chamber and said solvent removal chamber and being provided with a liquid inlet, said solvent removal chamber being provided with a gas outlet and with a liquid outlet.

9. (once amended) The apparatus of claim 8 wherein said hydrogenation apparatus is further provided with magnetic shielding such that the magnetic field within at least part of said hydrogenation chamber and/or within at least part of said conduit is <50 μT.

10. (once amended) The apparatus of claim 9 wherein said magnetic field is <1 μT.

11. (once amended) The apparatus of claim 9 wherein said magnetic field is <0.1 μT.

12. (once amended) The apparatus of claim 8 wherein said conduit is provided with a liquid inlet between said hydrogenation chamber and said catalyst removal chamber.

14. (new) The process of claim 1 further comprising subjecting said hydrogenated imaging agent to a magnetic field having a field strength at or below the ambient magnetic field strength of the earth.

15. (new) The process of claim 1 further comprising dissolving said imaging agent in an aqueous medium.

16. (new) The process of claim 14 further comprising separating said catalyst from said solution of imaging agent in aqueous medium.

17. (new) The process of claim 14 further comprising separating said solvent from said solution of imaging agent in aqueous medium.

18. (new) The process of claim 14 further comprising freezing solution of imaging agent in aqueous medium.